6 Dec 63

HARDWARE SUBMITTED FOR EVALUATION

Variable Contrast Phosphor Viewer (PAR 209)

It has long been recognized that photo interpretation is a subjective process in which individual preference as to print density and contrast can play an important part. "Density Cut" prints and the deliverate variation in the contrast of prints as made in and for different facilities are accepted practices aimed at satisfying these preferences.

The Variable Contrast Phosphor Viewer, developed in part under PAR 209, is an attempt to make these variations available to all P.I.'s from a single print. Operating instruction have been prepared and the prototype unit is now available for field test and evaluation.

With this device a change in apparent contrast can be achieved but the effect has turned out to be less dramatic than had been expected. It now appears that while thin prints can be made to show pronounced changes in apparent contrast the effect diminishes rapidly as the over-all density level increases. While this limits the usefulness of the present device, it should not seriously hamper the evaluation of general principle.

In our preliminary investigation we limited our inquiry for suitable phosphors to those having a "white" emission. If this device appears to be useful in principle a further investigation of phosphors without this limitation might disclose brighter materials which would extend the useful range of film density over which the effect can be maintained.

A further possible limitation is imposed on the use of the viewer in that, since the U. V. radiation must pass through the print, any magnifier which might be used must be kept well away from the print so as not to cut off radiation to the phosphor.

We feel that the above limitations restrict the usefulness and convenience of the subject viewer; however, we herewith submit it for independent evaluation and a decision as to the desirability of follow-on effort.

Operating instructions have been prepared and are included with this submission.

Operation of the Variable Contrast Phosphor Viewer (Prototype)

Requirement

1. Table or desk in a subdued light area.
2. 120 Volt a. c. outlet.

Viewer

The viewer consists of two components: the console or base unit, and an auxiliary light source and magnifying viewer.

The console contains the control elements for the lamps in the table viewer and the magnifying viewer. The base unit consists of a viewing box with three, 8 watt white fluorescent lamps, a color compensating filter and a phosphor coated glass plate (the phosphor coating to be exposed). A positive or negative transparent film is placed emulsion down on top of the phosphor plate and the magnifying viewer is placed on top of the film. The magnifying viewer contains two, 4 watt U. V. lamps.

These fluorescent lamp light sources are operated on direct current from full wave rectifiers. The usual a.c. ballasts are not used. High voltage direct current discharged through the lamps to ground bars, adjacent to the lamps, is used to start these gas discharge lamps. Current is limited by individual resistors in each direct current lamp circuit. Dimming is accomplished by means of variable autotransformers. They vary the alternating current input to the rectifiers.

Operation of Phosphor Viewer

Maximum contrast is achieved when only the lamps are lighted in the magnifying viewer and the ultraviolet passes through the film and excites the phosphor. Variations in contrast are achieved by dimming the U. V. lamps and brightening the white light in the base unit and vice versa.

The U. V. lamps used in the assembly are safe and should not damage the eyes or skin.

This unit is 18-inches wide by 15-inches deep and is 11-inches high.

Operation

1. Plug line cord into 115v, 60 cycle a.c. source.
2. Place on-off switch to "on" position.
3. Turn both knobs fully clockwise.

4. Momentarily press the right hand and left hand red push buttons (this will light the fluorescent bulbs in the base unit and the magnifying viewer).

5. Place film, emulsion down, over the phosphor plate.

6. Place magnifying viewer on top of the film (the case of the magnifying viewer should press the film into good contact with the phosphor plate).

7. Adjustment of the right hand knob changes the intensity of the ultraviolet source in the magnifying viewer.

8. Adjustment of the left hand knob changes the intensity of the source in the body of the viewer.

9. The glass phosphor plate must be place in the base unit with the phosphor coating up. This allows the best contact between phosphor and film emulsion.